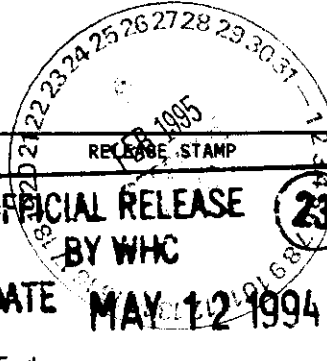


START

ENGINEERING CHANGE NOTICE

Page 1 of 21. ECN **602376**Proj.
ECN N/A

2. ECN Category (mark one) Supplemental <input type="checkbox"/> Direct Revision <input checked="" type="checkbox"/> Change ECN <input type="checkbox"/> Temporary <input type="checkbox"/> Standby <input type="checkbox"/> Supersedeure <input type="checkbox"/> Cancel/Void <input type="checkbox"/>		3. Originator's Name, Organization, MSIN, and Telephone No. C.E. Hodge/Remediated Waste Projects A5-56/376-0319		4. Date April 18, 1994	
		5. Project Title/No./Work Order No. Environmental Restoration Disposal Facility / W-296	6. Bldg./Sys./Fac. No. N/A	7. Impact Level 4	
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11a. Modification Work [] Yes (fill out Blk. 11b) [X] No (NA Blks. 11b, 11c, 11d)		11b. Work Package No. N/A	11c. Modification Work Complete N/A _____ Cog. Engineer Signature & Date		11d. Restored to Original Condition (Temp. or Standby ECN only) N/A _____ Cog. Engineer Signature & Date
12. Description of Change Modify Functional Design Criteria (FDC) to reflect following changes: Change {Environmental Restoration Storage and Disposal Facility to Environemtnal Restoration Disposal Facility} throughout document. Change {ERSDF to ERDF} throughout document. Section 2.3, change {55 people to 167 people will be requiried}. Section 2.2, change {4 square miles to 1.6 square miles}. Seciton 3.3, first paragraph second sentence should read "Waste from the 100 and 300 Areas will arrive along the northern side of the ERDF by rail and truck in reusable containers (32 - cubic yard). Third sentence should read "The containers will be transported on modified rail flatcars and flatbed trucks. Second paragraph, delete Attachment A and add Attachment 1. Section 5.8, first sentence, delete "WHC-EP-0063. The ERDF will have its own stand alone Waste Acceptance Criteria.					
13a. Justification Criteria Change [X] Design Improvement [] Environmental [] (mark one) As-Found [] Facilitate Const. [] Const. Error/Omission [] Design Error/Omission []					
13b. Justification Details Revisions to the FDC are required to reflect actual Conceptual Design Report (CDR) requirements. Funding constraints prompted earlier revision to CDR.					
14. Distribution (include name, MSIN, and no. of copies) B. L. Foley A5-19 5 copies See attached distribution sheet				RECEIVED JUN 01 1994 ERDF DMC	
<div style="text-align: right;"> RELEASE STAMP OFFICIAL RELEASE BY WHC DATE MAY 12 1994 #10</div>					

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Page 2 of 2

1. ECN (use no. from pg. 1)

602376

15. Design Verification Required

☐ Yes
☒ No

16. Cost Impact

ENGINEERING

Additional ☐ \$ N/A
Savings ☐ \$ N/A

CONSTRUCTION

Additional ☐ \$ N/A
Savings ☐ \$ N/A

17. Schedule Impact (days)

Improvement ☐ N/A
Delay ☐ N/A

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

SDD/DD	<input type="checkbox"/>	Seismic/Stress Analysis	<input type="checkbox"/>	Tank Calibration Manual	<input type="checkbox"/>
Functional Design Criteria	<input type="checkbox"/>	Stress/Design Report	<input type="checkbox"/>	Health Physics Procedure	<input type="checkbox"/>
Operating Specification	<input type="checkbox"/>	Interface Control Drawing	<input type="checkbox"/>	Spares Multiple Unit Listing	<input type="checkbox"/>
Criticality Specification	<input type="checkbox"/>	Calibration Procedure	<input type="checkbox"/>	Test Procedures/Specification	<input type="checkbox"/>
Conceptual Design Report	<input type="checkbox"/>	Installation Procedure	<input type="checkbox"/>	Component Index	<input type="checkbox"/>
Equipment Spec.	<input type="checkbox"/>	Maintenance Procedure	<input type="checkbox"/>	ASME Coded Item	<input type="checkbox"/>
Const. Spec.	<input type="checkbox"/>	Engineering Procedure	<input type="checkbox"/>	Human Factor Consideration	<input type="checkbox"/>
Procurement Spec.	<input type="checkbox"/>	Operating Instruction	<input type="checkbox"/>	Computer Software	<input type="checkbox"/>
Vendor Information	<input type="checkbox"/>	Operating Procedure	<input type="checkbox"/>	Electric Circuit Schedule	<input type="checkbox"/>
OM Manual	<input type="checkbox"/>	Operational Safety Requirement	<input type="checkbox"/>	ICRS Procedure	<input type="checkbox"/>
FSAR/SAR	<input type="checkbox"/>	IEFD Drawing	<input type="checkbox"/>	Process Control Manual/Plan	<input type="checkbox"/>
Safety Equipment List	<input type="checkbox"/>	Cell Arrangement Drawing	<input type="checkbox"/>	Process Flow Chart	<input type="checkbox"/>
Radiation Work Permit	<input type="checkbox"/>	Essential Material Specification	<input type="checkbox"/>	Purchase Requisition	<input type="checkbox"/>
Environmental Impact Statement	<input type="checkbox"/>	Fac. Proc. Samp. Schedule	<input type="checkbox"/>		<input type="checkbox"/>
Environmental Report	<input type="checkbox"/>	Inspection Plan	<input type="checkbox"/>		<input type="checkbox"/>
Environmental Permit	<input type="checkbox"/>	Inventory Adjustment Request	<input type="checkbox"/>		<input type="checkbox"/>

19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision

Document Number/Revision

Document Number Revision

20. Approvals


Signature	Date	Signature	Date
OPERATIONS AND ENGINEERING		ARCHITECT-ENGINEER	
Cog Engineer C. E. Hodge	4/19/94	PE	
Cog. Mgr. V. R. Dronen	4/19/94	QA	
QA J. A. Peltier	4/22/94	Safety	
Safety J. L. Rathbun	4/26/94	Design	
Security		Environ.	
Environ. M. J. Lauterbach	4/26/94	Other	
Projects/Programs			
Tank Waste Remediation System			
Facilities Operations		DEPARTMENT OF ENERGY	
Restoration & Remediation		Signature or Letter No.	
Operations & Support Services		R. D. Freeburg	
IRM		ADDITIONAL	
Other		J. M. Henning	
		W. S. Chin	

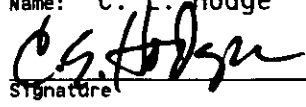
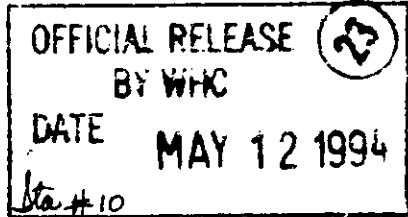
Date Received: 4-26-94 CW		INFORMATION RELEASE REQUEST		Reference: WHC-CM-3-4
Complete for all Types of Release				
Purpose <input type="checkbox"/> Speech or Presentation <input type="checkbox"/> Full Paper (Check only one suffix) <input type="checkbox"/> Summary <input type="checkbox"/> Abstract <input type="checkbox"/> Visual Aid <input type="checkbox"/> Speakers Bureau <input type="checkbox"/> Poster Session <input type="checkbox"/> Videotape			ID Number (include revision, volume, etc.) WHC-SD-W296-FDC-001 Rev. 1 List attachments: ECN-602376 Date Release Required April 30, 1994	
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CHECKLIST FOR SIGNATORIES				
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			Name (printed)	Signature Date
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FUNCTIONAL DESIGN CRITERIA
Environmental Restoration Storage and Disposal Facility
Project W-296

Issued by:

WESTINGHOUSE HANFORD COMPANY

July 1993

for the
U.S. DEPARTMENT OF ENERGY
RICHLAND OPERATIONS OFFICE
RICHLAND, WASHINGTON

PREPARED BY:

C. E. Hodge
C. E. Hodge, Senior Principal Engineer
Remediated Waste Projects

7/22/93
Date

WHC APPROVALS:

M. J. Lauterbach
M. J. Lauterbach
Manager, Environmental Engineering

7/22/93
Date

V. R. Dronen
V. R. Dronen
Manager, Remediated Waste Projects
Projects Department

7/23/93
Date

J. L. Rathbun
J. L. Rathbun
Manager, Nuclear Safety

7/22/93
Date

J. A. Peltier
J. A. Peltier
Manager, Engineering Applications Support
Quality Assurance

7-22-93
Date

DEPARTMENT OF ENERGY APPROVAL:

R. D. Freeberg
R. D. Freeberg, Director
Environmental Restoration Division
U.S. Department of Energy
Richland Operations Office

9/24/93
Date

FUNCTIONAL DESIGN CRITERIA
Environmental Restoration Storage and Disposal Facility
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WESTINGHOUSE HANFORD COMPANY

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for the
U.S. DEPARTMENT OF ENERGY
RICHLAND OPERATIONS OFFICE
RICHLAND, WASHINGTON

Department of Energy Approval
Continuation Sheet

N/A


J. M. Henning, Director
Waste Management Division

SEP 13 1993

Date

N/A

L. C. Williams, Director
Project Management Division

Date

CONTENTS

1.0	INTRODUCTION	1
1.1	BACKGROUND	1
1.2	SCOPE	1
2.0	FUNCTIONAL REQUIREMENTS	2
2.1	DESIGN LIFE	2
2.2	LOCATION	2
2.3	NUMBER OF PERSONNEL	2
2.4	EXTENT OF SERVICES PROVIDED	2
2.5	FUNCTIONAL FLEXIBILITY	2
	2.5.1 Waste Volumes	2
	2.5.2 Waste Categories	3
	2.5.3 Waste Treatment	3
3.0	WASTE DISPOSAL DESIGN CRITERIA	3
3.1	WASTE DISPOSAL REQUIREMENTS	3
3.2	WASTE DEFINITIONS AND CHARACTERISTICS	3
	3.2.1 Environmental Restoration Waste	3
	3.2.2 Decontamination and Decommissioning Waste	4
3.3	INTERFACE WITH WASTE SITE AND TRANSPORTATION ACTIVITIES	4
3.4	DECONTAMINATION OF EQUIPMENT	4
4.0	Environmental Restoration Disposal Facility	
	DESIGN CRITERIA	5
4.1	HEATING, VENTILATION, AND AIR CONDITIONING	5
4.2	UTILITIES	6
4.3	SITE PREPARATION	6
4.4	ENERGY CONSERVATION	6
4.5	MAINTENANCE AND REPAIR FACILITIES	7
	4.5.1 Maintenance Access	7
	4.5.2 Maintenance Order	7
	4.5.3 Special Equipment	7
4.6	COMMUNICATIONS SYSTEMS	8
4.7	FIRE PROTECTION	8
4.8	SUPPORT FACILITIES	9
4.9	RAILROAD REQUIREMENTS	9
5.0	GENERAL REQUIREMENTS	9
5.1	SAFETY	10
5.2	ENVIRONMENTAL PROTECTION	10
	5.2.1 Liquid Effluents	10
	5.2.2 Airborne Emissions	10
	5.2.3 Construction	11
	5.2.4 Noise	11
	5.2.5 Exposure	11
5.3	SECURITY	11

CONTENTS (Cont)

5.4	DRAWING REQUIREMENTS	12
5.5	QUALITY ASSURANCE	12
5.6	DECONTAMINATION AND DECOMMISSIONING	12
5.7	NATURAL FORCES CRITERIA	13
5.8	AUTOMATIC DATA PROCESSING	13
6.0	CODES, STANDARDS, AND CRITERIA	14

ATTACHMENTS:

WASTE VOLUME FOR DISPOSAL BY YEAR (CUBIC YARDS)	A-1
WASTE FORMS	A-2
REGULATORY DEFINITIONS FOR DESIGN PURPOSES	A-3

1.0 INTRODUCTION

The U.S. Department of Energy (DOE) has identified an Environmental Restoration major systems acquisition (MSA), which contains activities such as characterization, treatment, storage, design of remediation systems, waste minimization, and feasibility studies. The Environmental Restoration Disposal Facility (ERDF) is a subproject within this MSA and will provide a facility for the final disposal of waste generated from the remediation of past-practice sites at Hanford. The ERDF will be designed, constructed, and operated to accommodate all solid low-level and mixed waste derived from environmental restoration, including decontamination and decommissioning (D&D) activities. Project W-296 will provide the initial facilities necessary for startup and operation throughout the life of the facility.

A significant portion of the waste characterization data will not be available until actual waste site excavations are under way. Attachment A presents waste forms and volume projections estimated by the Environmental Division of Remediation and Restoration.

1.1 BACKGROUND

The Hanford Project was established in 1943 for the purpose of producing plutonium for nuclear weapons. To accomplish this defense mission, nine nuclear reactors were constructed in the 100 Area located along the Columbia River. The 200 Areas have been used for waste management functions, associated with the processing of spent nuclear fuels and byproducts. The 300 Area has been used for various support roles to the 100 and 200 Areas. A significant amount of waste generated during these activities were disposed of to or buried in the ground, generating many areas that are radiologically and chemically contaminated.

Plans to discontinue the defense production mission at the site were announced in 1990. The current site mission reflects the cleanup of Hanford. This includes remediation of past-practice sites and permanent disposal of this remediated waste.

1.2 SCOPE

Project W-296 will be designed and constructed for the permanent disposal of containerized and bulk waste derived by environmental restoration and D&D activities of past-practice sites. Project W-296 will provide disposal facilities, rail and tractor-trailer container handling capability, equipment and personnel decontamination facilities, maintenance facilities, fencing, roads, utilities, inventory control systems, communication systems, and administrative offices.

2.0 FUNCTIONAL REQUIREMENTS

2.1 DESIGN LIFE

Disposal in the ERDF is intended to be permanent. For the physical plant portion of the ERDF (e.g. administrative building, decontamination facilities, etc.), the design life is 30 years.

2.2 LOCATION

The ERDF will be sited southeast of the Hanford 200 West Area and occupy approximately 1.6 square miles.

2.3 NUMBER OF PERSONNEL

Approximately 167 people will be required to operate the ERDF. They will consist of management, engineering, clerical and maintenance personnel.

For design purposes, the ERDF will operated two shifts per day, 5 days/week.

2.4 EXTENT OF SERVICES PROVIDED

The ERDF will operate similar to other Hanford facilities and rely on existing site-wide support services, (e.g. accounting, procurement, security, etc).

2.5 FUNCTIONAL FLEXIBILITY

2.5.1 Waste Volumes

An estimated 28.5 million cubic yards of waste, including 2 million cubic yards from decontamination and decommissioning activities, will eventually be disposed of in the ERDF. The volume of waste for the first 5 years is shown in attachment 1.

2.5.2 Waste Categories

The waste categories are shown on Attachment 1.

2.5.3 Waste Treatment

Any treatment of environmental restoration waste required for disposal shall happen prior to receipt at the ERDF.

No liquid effluents except for sanitary sewer effluents will be disposed of at the ERDF site.

3.0 WASTE DISPOSAL DESIGN CRITERIA

3.1 WASTE DISPOSAL REQUIREMENTS

The design of the ERDF must satisfy the requirements of DOE 5820.2A, *Radioactive Waste Management*, DOE 6430.1A, *General Design Criteria*, DOE 5400.5, *Radiation Protection of the Public and the Environment*, and DOE 5480.11, *Radiation Protection for Occupational Workers*. It must also comply with WHC control manuals WHC-CM-4-9, *Radiological Design*, WHC-CM-1-6, *WHC Radiological Control Manual*, WHC-CM-4-11, *ALARA Program Manual*, and federal regulation 40 CFR 1910, *Occupational Safety and Health Act*), WAC 173-303, *Dangerous Waste Regulations* and WHC-EP-0063, *Hanford Site Solid Waste Acceptance Criteria*.

The design of the ERDF must satisfy the requirements of DOE-RL 5440.1A *Implementation of the National Environmental Policy Act* at the Richland Operations Office, and DOE-RL 5480.1A *Environmental Safety and Health Program* for Department of Energy for Richland Operations.

3.2 WASTE DEFINITIONS AND CHARACTERISTICS

3.2.1 Environmental Restoration Waste

The ERDF must be capable of receiving and disposing of environmental wastes as discussed in the "*100 B/C Environmental Restoration Predesign Guidance Document*", WHC-SD-EN-DGS-001, Rev. 0. The design waste types, categories, and volumes are presented in Attachment 1 to this document.

3.2.2 Decontamination and Decommissioning Waste

Decontamination and Decommissioning waste to be disposed of at the ERDF for the first five years is 15,800 cu. yds.

3.3 INTERFACE WITH WASTE SITE AND TRANSPORTATION ACTIVITIES

Waste disposed of at the ERDF originates throughout the Hanford Site. Waste disposed of in the portion of the facility being designed by Project W-296 is from the 100 Areas, and the 300 Area. Waste from the 100 and 300 Areas will arrive along the northern side of the ERDF by rail and truck in reusable containers (32-cubic yard). The containers will be transported on modified rail flatcars and flatbed trucks. Rail lines included in the scope of this project start at the Hanford Railroad System "Suzie Switch" north of 200 West Area. Packaging and shipping shall meet the requirements of WHC-CM-2-14.

The ERDF must be capable of receiving trains and handling the containers at a rate compatible with waste site activities at a rate of 2.1 million cubic yards per year.

Site vehicular transportation shall be tied into Route 3.

The ERDF design shall make use of off-the-shelf equipment wherever possible.

All waste delivered to the ERDF will have been previously analyzed, categorized, separated at the waste sites, such that disposal consists of routing containers to the correct disposal unit(s). The disposition location will be added to the tracking system with sufficient detail to ensure traceability and documentation of the disposed waste material. The waste identification/tracking system used at the ERDF must be interfaced and compatible with the waste site characterization systems used at the individual waste sites.

3.4 DECONTAMINATION OF EQUIPMENT

The ERDF shall provide decontamination capabilities sufficient to allow repeated use of all tractor/trailer, rail, container, and support equipment required in the remediation operation.

The design shall use materials for decontamination that are not restricted by regulatory agencies. Minimization techniques shall be utilized in the recycling of all decontamination materials.

4.0 ENVIRONMENTAL RESTORATION STORAGE AND DISPOSAL FACILITY DESIGN CRITERIA

The ERDF shall be designed to facilitate operations and maintenance while minimizing the number of operations personnel, project and operational cost, and equipment down time. All structures shall protect equipment, components, and personnel from environmental conditions on the Hanford Site. The design shall use information contained in *Hanford Plant Standard, Standard Design Criteria 5.1, Heating Ventilating, and Air Conditioning*. Support facilities, such as change rooms, rest rooms, showers, and lunch rooms shall be provided in accordance with Occupational Safety and Health Administration (OSHA) regulations. The facilities shall be designed in an energy efficient manner, without jeopardizing the integrity or the performance of ERDF systems. The facilities shall provide sufficient redundant capacity to support operations, maintenance and repair.

The design of all electrical, mechanical, and instrument systems shall provide for return to the safest mode in event of failure. Systems required for environmental monitoring, safety, and/or processes (where recovery operations would be expensive and/or hazardous) shall be provided with redundant or backup systems. Human factor engineering shall be used throughout the design to minimize the chance of operator error.

The degree of reliability provided shall enable the system or systems to function efficiently throughout the intended operating life of the ERDF without undue maintenance and repair under normal operating and accident conditions, for which they are designed.

4.1 HEATING, VENTILATION, AND AIR CONDITIONING

The facilities or portions of the facilities that require normal personnel occupancy shall be heated and cooled. Buildings or portions of the buildings housing equipment and components that are not normally occupied, but require access by operators or maintenance personnel, shall be heated and cooled. The degree of heating and cooling provided shall be based on the requirements of the equipment and human factors regarding the operations and maintenance personnel. The systems shall comply with the requirements of DOE 6430.1A, General Design Criteria.

The heating, ventilating, and air conditioning (HVAC) system shall maintain airflow from noncontaminated areas to areas of progressively higher potential contamination.

4.2 UTILITIES

The ERDF shall be designed to include all utilities required for safe and reliable operation. Utilities include the following components:

- service and potable water
- electrical power
- communication systems
- sanitary and process sewer.

Utility systems shall be sized for the specific building or ERDF demands. Utility service connections will be available to the ERDF for sanitary and service water and electrical power, from the southeast portion of the 200 West Area. The water and electrical power requirements and interface location shall be determined during conceptual design. Upgrades to existing utilities distribution systems necessary for the operations of the ERDF shall be provided.

Backflow prevention devices will be provided on all water and system supplies to the ERDF. The utility system shall be designed with consideration given to the capacity appropriate with this project and the future expansion of the ERDF.

Lighting levels shall meet the requirements of DOE 6430.1A, General Design Criteria. Office lighting shall be the recessed type, and designed to minimize glare on cathode ray tube (CRT) screens.

4.3 SITE PREPARATION

The ERDF design shall make provisions for horizontal and vertical land survey control.

4.4 ENERGY CONSERVATION

The ERDF shall comply with energy conservation requirements and shall be justified by Life Cycle Cost Analysis (LCCA) as defined in DOE 6430.1A, General Design Criteria, Section 110-12.

4.5 MAINTENANCE AND REPAIR FACILITIES

4.5.1 Maintenance Access

The facilities and equipment design shall facilitate access for maintenance with provisions for equipment and material removal, lubrication, and testing. Where possible, the ERDF components shall be designed to:

- Use interchangeable parts
- Provide access for visual inspection
- Provide access for disassembly
- Allow maintenance with standard tools
- Provide labeled piping, valves, instrumentation, and equipment.

4.5.2 Maintenance Order

Design shall reflect the following order of preference for performing maintenance:

- Adjust or repair item or unit in place
- Repair item or unit by contact maintenance with radiation dose rates consistent with ALARA principles
- Replace item or unit with spare unless it is more resource efficient to remove, decontaminate, repair, and return to service or perform remote maintenance
- Label equipment systems, instrumentation, valves, etc.

4.5.3 Special Equipment

Equipment items that require special and unique maintenance tool(s) shall be identified. Special instructions shall be included with the equipment, and any special tools required to maintain equipment shall be provided.

Equipment used within the ERDF radiation controlled area shall be considered regulated equipment as defined in WHC-CM-1-6, *Radiological Control Manual*.

4.6 COMMUNICATIONS SYSTEMS

The project shall provide the following communication systems:

- Internal and external telecommunications
- Crash alarm and evacuation siren
- Emergency alarms for all areas
- Transmittal of essential alarms to Hanford Fire Department
- Transmittal of data to and from the Hanford Local Area Network (HLAN).
- Solid Waste Information Tracking System (SWITS) support interface

This system shall be integrated with the existing Solid Waste Information Tracking System (SWITS).

Carpeting for the ERDF shall be anti-static to reduce static interference with computer equipment.

4.7 FIRE PROTECTION

The minimum ERDF requirements for fire protection shall be in accordance with DOE 6430.1A, General Design Criteria, DOE-RL 5480.4A, Environmental Protection, Safety, and Health Protection Standards for RL, DOE 5480.7A, Fire Protection, WHC-CM-4-41, Fire Protection Program Manual, and the Uniform Fire Code to the extent it is implemented by WAC-173-303. Backflow prevention shall meet the requirements of WAC 248-54-285, Public Water Supplies, Gross Connection Control, and the American Waterworks Association (AWWA), Pacific Northwest Section, Accepted Procedure and Practice in Cross Connection Control Manual.

Fire protection design features shall be determined by a Fire Hazard Analysis (FHA) in accordance with the memorandum from EH-31.3, Guidance on the Performance of Fire Hazards Analysis, November 7, 1991, and WHC-CM-4-41, Fire Protection Program Manual. The FHA shall be developed in conjunction with the Conceptual Design Report and revised as necessary to incorporate additional design features. A final FHA shall be released in conjunction with the ERDF Final Safety Analysis Report (FSAR).

Noncombustible construction materials shall be used to the greatest extent possible.

4.8 SUPPORT FACILITIES

Support facilities shall be provided for personnel required to operate the ERDF. The following is a listing of the basic required support facilities within the ERDF:

- Administrative building
- Men's and women's rest rooms and change rooms with Special Work Permit (SWP) clothing areas separate from personal clothing areas (design shall assume 70% men and 30% women)
- SWP and nonregulated (soiled and clean) clothing receiving storage, and loadout areas
- Decontamination facility
- Waste verification facilities

Emergency egress systems shall be designed in accordance with *NFPA 101*. Exits, stairs, platforms, handrails and rest rooms shall meet the requirements for proper access and egress. Handicapped considerations shall be incorporated into the Administrative building in accordance with *UBC* and *ANSI A117.1*.

4.9 RAILROAD REQUIREMENTS

The design and construction of railway facilities and equipment shall meet the requirements as set forth in the *American Railway Engineering Association Manual for Railway Engineering, Volumes I and II*. All design activities shall be interfaced with the existing Hanford railroad operation and maintenance organizations.

5.0 GENERAL REQUIREMENTS

The ERDF shall comply fully with all environmental standards applicable to low-level radioactive and radioactive mixed waste disposal facilities. This includes compliance with all Federal and State regulations pertinent to hazardous waste, and DOE orders pertaining to disposal of low-level radioactive waste.

5.1 SAFETY

The ERDF has been classified as a low hazard, nonreactor nuclear facility in accordance with the criteria set forth in the hazard classification report, WHC-SD-W296-HC-001, and DOE Order 5480.23, *Nuclear Safety Analysis Reports*, and shall be designed to comply with the requirements for radioactive solid waste facilities specified in DOE 6430.1A, *General Design Criteria*, DOE Order 5483.1A, *Occupational Safety & Health Program For DOE Contractor Employees At Government Owned Contractor Operated Facilities*. The ERDF shall be designed to meet worker and public exposure criteria.

Safety classification of systems, components and structures is defined in WHC-CM-1-3, *Management Requirements and Procedures (MRP 5.46) Safety Classification*. The ERDF systems, structures, and components safety classifications will be identified during the Preliminary Safety Evaluation (PSE) prior to commencement of Title I Design activities. Safety Analysis Reports (SARs) will be prepared in accordance with DOE 5480.23, *Nuclear Safety Analysis Reports*.

Vehicular signs shall comply with *American National Standards Institute (ANSI) D6.1*.

5.2 ENVIRONMENTAL PROTECTION

The ERDF shall be designed to minimize the impact on the environment in accordance with DOE 5400.1, *General Environmental Protection Program*, DOE 5480.4, *Environmental Safety and Health Protection Standards*, DOE-RL 5440.1A, *Implementation of the National Environmental Policy Act at the Richland Operations Office*. The design of the ERDF shall be in sufficient detail to allow an assessment of its environmental impacts.

5.2.1 Liquid Effluents

Sanitary waste drain field(s) shall be located downgradient of the site, and situated in such a way as to preclude influencing monitoring well results.

Surface runoff/runoff shall be controlled to insure that runoff and runoff is always diverted from disposal units and support facilities.

5.2.2 Airborne Emissions

Provisions to control both fugitive emissions and emissions from ventilation systems shall be included in the ERDF design.

Dust emissions from waste disposal operations (haul roads, dumping, etc.) shall be in accordance with WHC-CM-7-5, Environmental Compliance Manual, Section 2.0 Air Quality and Section 7.0 Solid Waste Management.

5.2.3 Construction

Measures shall be implemented to minimize airborne particulate emissions during construction. Such measures may include, but are not limited to:

- Periodically watering disturbed areas
- Stabilizing spoils piles and unpaved roads using approved chemical fixatives, coverings, or watering.

During construction, all activities shall be compliant with the requirements of WHC-CM-7-5, Environmental Compliance Manual, Part C, Nonradioactive Airborne Emissions, and Occupational Safety and Health Act requirements.

5.2.4 Noise

Occupational standards as set forth in 29 CFR 1910.95, "Occupation Noise Exposure" pertaining to noise abatement shall apply.

5.2.5 Exposure

The ERDF shall be designed to mitigate chemical exposure to onsite workers and the public in accordance with 29 CFR 1910, Subpart Z.

5.3 SECURITY

The ERDF shall be designed in accordance with DOE 6430.1A, General Design Criteria. Personnel and vehicular access to the ERDF shall be restricted by use of fencing and gates. No unauthorized personnel will be permitted onto the site.

All building exterior doors shall be provided with security locks. The exterior of buildings shall be illuminated and the exterior lighting shall be automatically controlled by photoelectric sensors. Emergency exit lighting shall be provided as required by NFPA 101. The requirements as specified in DOE 6430.1A, General Design Criteria, regarding lighting within 25 miles of an observatory, shall be followed.

Design of the ERDF shall comply with DOE 5632.6, Physical Protection of DOE Property and Unclassified Facilities.

5.4 DRAWING REQUIREMENTS

All drawings generated as a result of ERDF design activities shall be controlled as required by *Standard Design Criteria (SDC) 1.3, (Preparation and Control of Engineering and Fabrication Drawings)*. Design drawings need not be generated using AutoCAD, but must be capable of transfer to AutoCad.

5.5 QUALITY ASSURANCE

Quality assurance (QA) activities for all contractors involved in design, construction, and testing phases of the ERDF shall be formulated and executed in accordance with a DOE approved, project-specific QA plan. The plan shall ensure the following objectives:

- The facility is designed to meet the program requirements
- Prepared plans and specifications adequately cover QA requirements
- Construction is performed in accordance with the design
- Testing is performed to confirm the adequacy of design, quality of construction, and quality of manufactured components.

QA and quality control (QC) activities shall be performed in accordance with DOE 5700.6C, Quality Assurance, and EPA/530-SW-86-031, Construction Quality Assurance for Land Disposal Facilities. Assurance that the QA and QC requirements have been effectively implemented shall be confirmed by periodic audits and surveillance oversight.

5.6 DECONTAMINATION AND DECOMMISSIONING

The following items shall be considered during the design of the ERDF to facilitate decontamination, decommissioning, and closure activities:

- Polished surfaces, coatings or liners on walls, floors, and ceilings suitable for washing or wipedown.
- Air exhaust filters at or near individual radioactive material or other containment enclosures to minimize contamination of ventilation ducts.
- Surfaces free of crevices, corners, ledges and/or protrusions that can collect contaminated materials.
- Surfaces that can be easily flushed with a minimum quantity of water or decontamination solution.
- Surface coatings compatible with decontaminating agents, taking into consideration any degradation expected to occur.

- Access ports (e.g. doorways, ventilation ducts) designed to minimize problems when closing and/or sealing penetrations at the time of decommissioning.
- Waterproofed penetrations to provide protection during spraying and hosing-type decontamination efforts.
- Processing and chemical storage areas with monolithic, nonporous floors and sloped towards the sumps or drains.
- Continually sloped and trap-free piping systems.
- Physical provisions for cleaning and draining the piping.
- Construction materials resistant to radiation, process solutions, and decontamination agents (materials that are not resistant shall be nonabsorbent or easily replaceable).
- Wide aisles to facilitate movement of equipment and material.
- Adequate overhead clearance for remote transfers.
- Skid-mounted equipment or systems with fasteners, piping, and service connections designed for easy access and manipulation.
- Rigging and attachment points to facilitate removal of skids and/or equipment.
- Piping and service connections designed for easy access.

5.7 NATURAL FORCES CRITERIA

The ERDF shall be designed in accordance with Hanford Plant Standard, Standard Design Criteria 4.1, Design Loads for Facilities; so that occurrences of natural phenomena design basis accidents do not result in unacceptable safety consequences.

5.8 AUTOMATIC DATA PROCESSING

A ERDF data management system shall be designed to record information concerning the receipt, handling, and placement of waste as required by 40 CFR Part 264.309, "Surveying and Record Keeping". The system shall include all the required hardware and software to track all incoming waste containers (volumes) utilizing electronic Bar Code Systems interfaced with existing SWITS database for archiving.

6.0 CODES, STANDARDS, AND CRITERIA

This project shall be designed and construction in accordance with the regulations, codes, and standards listed below. The division 13 and section "-99" requirements of DOE 6430.1A, General Design Criteria, are applicable as the ERDF is a nonreactor, nuclear facility. The latest revision of these regulations, codes, and standards are applicable:

- DOE Order 5400.1, General Environmental Protection Programs
- DOE Order 5400.5, Radiation Protection of the Public and Environment
- DOE-RL 5440.1A, Implementation of the National Environmental Policy Act at the Richland Operations Office
- DOE-RL Order 5480.1A, Environmental Safety and Health Program for Department of Energy Operations for Richland Operations
- DOE-RL Order 5480.2A, Radiation Waste Management
- DOE Order 5480.4, Environmental Protection, Safety, and Health Protection Standards
- DOE-RL Order 5480.4A, Environmental Protection, Safety, and Health Protection Standards for RL
- DOE Order 5480.7A, Fire Protection
- DOE Order 5480.11, Radiation Protection for Occupational Workers
- DOE Order 5480.23, Nuclear Safety Analysis Reports
- DOE-RL Order 5481.1, Safety Analysis and Review System
- DOE-RL Order 5483.1A, Occupational Safety & Health Program For DOE Contractor Employees At Government Owned Contractor Operated Facilities
- DOE Order 5632.6, Physical Protection of DOE Property and Unclassified Facilities
- DOE Order 5700.6C, Quality Assurance
- DOE Order 5820.2A, Radioactive Waste Management
- DOE Order 6430.1A, General Design Criteria

- DOE-RL Order 6430.IC, Hanford Plant Standards (HPS) Program
- SDC 1.3, Preparation and Control of Engineering and Fabrication Drawings
- SDC 4.1, Design Load for Facilities
- SDC 5.1, Heating, Ventilating, and Air Conditioning
- EPA/530-SW-86-031, Construction Quality Assurance for Land Disposal Facilities
- American Railway Engineering Association, "Manual For Railway Engineering, Volumes I and II"
- Title 29 CFR 1910, Subpart Z
- Title 29 CFR 1910-95, Occupation Noise Exposure
- Title 40 CFR 1910, Occupation Safety and Health Act
- Title 40 CFR 260-270, Resource Conservation and Recovery Act (RCRA)
- Title 40 CFR 264.309, Surveying and Record Keeping
- WAC-173-303, Dangerous Waste Regulations
- WAC-248-54-285, Public Water Supplies, Gross Connection Control
- WHC-CM-1.3, Management Requirements and Procedures
- WHC-CM-1.6, Radiological Control Manual
- WHC-CM-2-14, Hazardous Material Packaging and Shipping
- WHC-CM-4-2, Quality Assurance Manual
- WHC-CM-4-3, Industrial Safety manual
- WHC-CM-4-9, Radiological Design
- WHC-CM-4-11 "ALARA Program Manual"
- WHC-CM-4-41, Fire Protection Program Manual
- WHC-CM-4-46 "Non-reactor Facility Safety Analysis Manual"
- WHC-CM-7-5 "Environmental Compliance Manual"

- WHC-EP-0063, Hanford Site Solid Waste Acceptance Criteria
- WHC-SD-W296-HC-001, Rev. 0 "Project W-296 Hazard Classification Report"

In addition to the above standards, applicable "National Consensus" Codes and Standards and pertinent state and local codes and standards will be used. The latest edition of all codes and standards will be used.

WASTE VOLUME FOR DISPOSAL BY YEAR (1,000 CUBIC YARDS)							
WASTE FORM	WASTE CATEGORY	1997	1998	1999	2000	2001	TOTAL
Overburden	Contact Handled (CH) Low Level Waste (LLW) Cat. 1	308.1	474.5	438.0	500.7	568.8	2290.1
	Remote Handled (RH) Low Level Waste (LLW) Cat. 1	0.1	0.3	0.4	0.5	0.6	1.9
	Non-Hazardous, Non Radioactive	0.0	0.0				0.0
	CH Low Level Mixed Waste (LLMW) Cat. 1	0.8	0.4	0.4	0.5	0.6	2.7
	RH Low Level Mixed Waste (LLMW) Cat. 1	0.1	0.3	0.4	0.5	0.6	1.9
	Hazardous/Dangerous	0.1	0.4	0.4	0.5	0.6	2.0
Soil	Contact Handled (CH) Low Level Waste (LLW) Cat. 1	230.9	690.9	568.0	620.4	645.5	2755.7
	Remote Handled (RH) Low Level Waste (LLW) Cat. 1	0.5	2.6	5.3	3.4	3.9	15.7
	Non-Hazardous, Non Radioactive	0.0	0.0				0.0
	CH Low Level Mixed Waste (LLMW) Cat. 1	15.5	10.5	11.9	13.0	13.5	64.4
	RH Low Level Mixed Waste (LLMW) Cat. 1	0.5	2.6	5.3	3.4	3.9	15.7
	Hazardous/Dangerous	1.0	5.2	6.0	6.5	6.7	25.4
Metals	Contact Handled (CH) Low Level Waste (LLW) Cat. 1	27.2	70.1	52.3	50.6	47.1	247.3
	Remote Handled (RH) Low Level Waste (LLW) Cat. 1	0.0	0.3	0.3	0.3	0.3	1.2
	Non-Hazardous, Non Radioactive	0.2	1.1	1.1	1.1	1.0	4.5
	CH Low Level Mixed Waste (LLMW) Cat. 1	1.6	1.1	1.1	1.1	1.0	5.9
	RH Low Level Mixed Waste (LLMW) Cat. 1	0.0	0.3	0.3	0.3	0.3	1.2
	Hazardous/Dangerous	0.1	0.5	0.5	0.6	0.5	2.2
Buried Waste	Contact Handled (CH) Low Level Waste (LLW) Cat. 1	20.2	49.4	36.8	35.0	33.3	174.7
	Remote Handled (RH) Low Level Waste (LLW) Cat. 1	0.6	2.6	2.7	2.5	2.4	10.8
	Non-Hazardous, Non Radioactive	0.6	2.6	2.7	2.5	2.4	10.8
	CH Low Level Mixed Waste (LLMW) Cat. 1	9.8	5.2	5.3	5.1	4.8	30.2
	RH Low Level Mixed Waste (LLMW) Cat. 1	0.6	2.6	2.7	2.5	2.4	10.8
	Hazardous/Dangerous	0.6	2.6	2.7	2.5	2.4	10.8
Demolition	Contact Handled (CH) Low Level Waste (LLW) Cat. 1	31.2	78.5	58.5	56.1	52.8	277.1
	Remote Handled (RH) Low Level Waste (LLW) Cat. 1	0.1	0.3	0.3	0.3	0.3	1.3
	Non-Hazardous, Non Radioactive	1.4	6.6	6.7	6.4	6.1	27.2
	CH Low Level Mixed Waste (LLMW) Cat. 1	0.8	0.3	0.4	0.3	0.3	2.1
	RH Low Level Mixed Waste (LLMW) Cat. 1	0.1	0.3	0.3	0.3	0.3	1.3
	Hazardous/Dangerous	0.2	0.6	0.7	0.6	0.6	2.7
Decomiss.	Contact Handled (CH) Low Level Waste (LLW) Cat. 1	0.3	3.7	3.7	3.6	3.9	15.2
	Remote Handled (RH) Low Level Waste (LLW) Cat. 1	0.0	0.1	0.1	0.2	0.2	0.6
	Non-Hazardous, Non Radioactive						0.0
	CH Low Level Mixed Waste (LLMW) Cat. 1						0.0
	RH Low Level Mixed Waste (LLMW) Cat. 1						0.0
	Hazardous/Dangerous						0.0
Total	Contact Handled (CH) Low Level Waste (LLW) Cat. 1	617.7	1363.4	1157.3	1266.4	1351.4	5756.2
	Remote Handled (RH) Low Level Waste (LLW) Cat. 1	1.3	6.2	9.1	7.2	7.7	31.5
	Non-Hazardous, Non Radioactive	2.2	10.3	10.5	10.0	9.5	42.5
	CH Low Level Mixed Waste (LLMW) Cat. 1	28.5	17.5	19.1	20.0	20.2	105.3
	RH Low Level Mixed Waste (LLMW) Cat. 1	1.3	6.1	9.0	7.0	7.5	30.9
	Hazardous/Dangerous	2.0	9.3	10.3	10.7	10.8	43.1
	Total	653.0	1412.8	1215.3	1321.3	1407.1	6009.5
Notes:	<p>Near-term wastes for 1997 and 1998 are included in CH LLW Cat. 1 and in CH LLMW Cat. 1</p> <p>All volumes rounded to the nearest 100 cubic yards, items having less than 50 cubic yards are rounded to 0.</p> <p>All waste types may contain up to 1% of Cat. 3 material.</p>						

WASTE FORMS

Contaminated Overburden - Soil, ranging in size from boulders to fine silt, dry to moist, free draining, may contain small and amount of contaminants ("Hanford soils"). Typically, this material resides above, and to the side of recognized waste sites.

Contaminated Soil - Same description as contaminated overburden, except in-place location is the waste site itself.

Metals - Metallic debris, mixed with nominal amounts of contaminated or uncontaminated soil, within the bounds of recognized waste site. Typically, this past-practice operations waste material is tube and pipe, structural shapes, metallic plate, discarded equipment, and shielding metals.

Buried Waste - Contaminated wood articles (railroad ties, dimensional lumber, plywood, etc.), contaminated consumable (cardboard, rags, paper, plastic, etc.).

Demolition Waste - Contaminated or uncontaminated concrete, rebar, timber, roofing, electrical debris, insulation, HVAC debris. Typically this definition is meant to encompass wastes buried during past practice D&D activities.

REGULATORY DEFINITIONS FOR DESIGN PURPOSES

Contact Handled - Contaminants are radiological only (do not qualify as hazardous/dangerous). Radiologic contaminants do not exceed 200 mrem/hr at contact.

Remote Handled - Contaminants are radiological only (do not qualify as hazardous/dangerous). Radiologic contaminants exceed 200 mrem/hr at contact.

Contact Handled Mixed - Contaminants are low activity, mixed with wastes meeting the descriptions contained in WAC 173-303-070 through 103 for dangerous waste or 40 CFR 261 for hazardous waste.

Remote Handled Mixed - Contaminants are high activity, mixed with wastes meeting the descriptions contained in WAC 173-303-070 through 103 for dangerous waste or 40 CFR 261 for hazardous waste.

Transuranic (TRU) - Contaminants are TRU only, and TRU mixed.

TRU Only - Contaminants are radiological only and exceed 100 nanocuries per gram (nCi/g) alpha.

TRU Mixed - Contaminants are radiological exceeding 100 nCi/g alpha, mixed with wastes meeting the descriptions contained in WAC 173-303-070 through 103 for dangerous waste or 40 CFR 261 for hazardous waste.

TRU Waste - Contaminated with alpha-emitting TRU radionuclides with half-lives greater than 20 years and in concentrations greater than 100 nCi/g of the waste matrix at the time of assay. Defined in WHC-EP-0063, "Hanford Site Solid Waste Acceptance Criteria," Section 3.

~~Dangerous-Nonrad - Contaminants are wastes meeting the descriptions contained in WAC 173-303-070 through 103 for dangerous waste or 40 CFR 261 for hazardous waste, and do not contain radiological contaminants.~~

Nondangerous-Nonrad - Wastes that are not contaminated with radiological, dangerous, or hazardous constituents.

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